

Digital advantage for breweries – Turning data into solutions

PROCESS AUTOMATION | Modern breweries generate vast amounts of data every day, but systematic analysis of this data has often been limited up to now. A data-based analysis tool is now available based on a digital twin of the production processes. The aim is to identify potential for optimisation along the entire value chain. A complementary consulting service supports breweries in deriving and implementing concrete measures and actions based on the insights gained.

MANY BREWERIES already collect extensive data along the entire value chain. This ranges from sensor values to laboratory data and energy consumption up to batch logs. In theory, everything necessary for sound data-based optimisation of brewing processes is available.

In practice, however, this potential often remains unexploited. There are many reasons for this: the various data sources are spread across multiple systems, difficult to access or require special expertise to evaluate. In addition, employees have little time in their daily work to systematically deal with the extensive and complex data analysis [1].

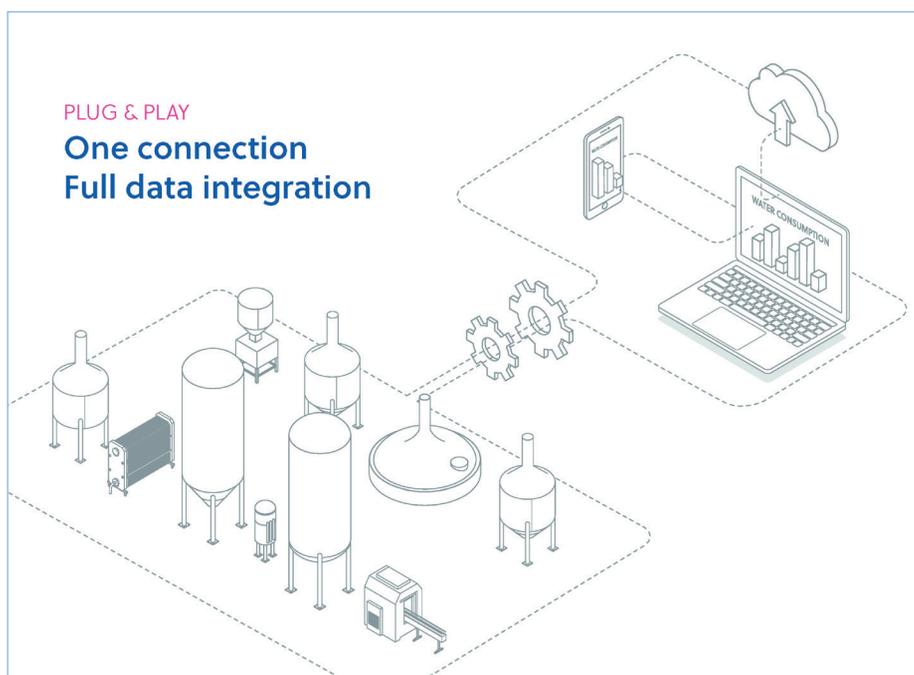
Furthermore, analysis alone is not enough. Even if data is processed and visualised, the next challenge arises: the data must be interpreted correctly and translated into concrete measures. A sudden increase in energy consumption or a fluctuation in brewhouse yield is initially only an undesirable deviation. Without context, root cause analysis and appropriate countermeasures, this optimization potential remains untapped [2].

Against this backdrop, it becomes clear that what is needed is not more sensors or even more data, but better ways to structure and analyse existing information in order to use this knowledge to derive the right optimisation measures.

➤ **Synergy between data analysis and expert knowledge**

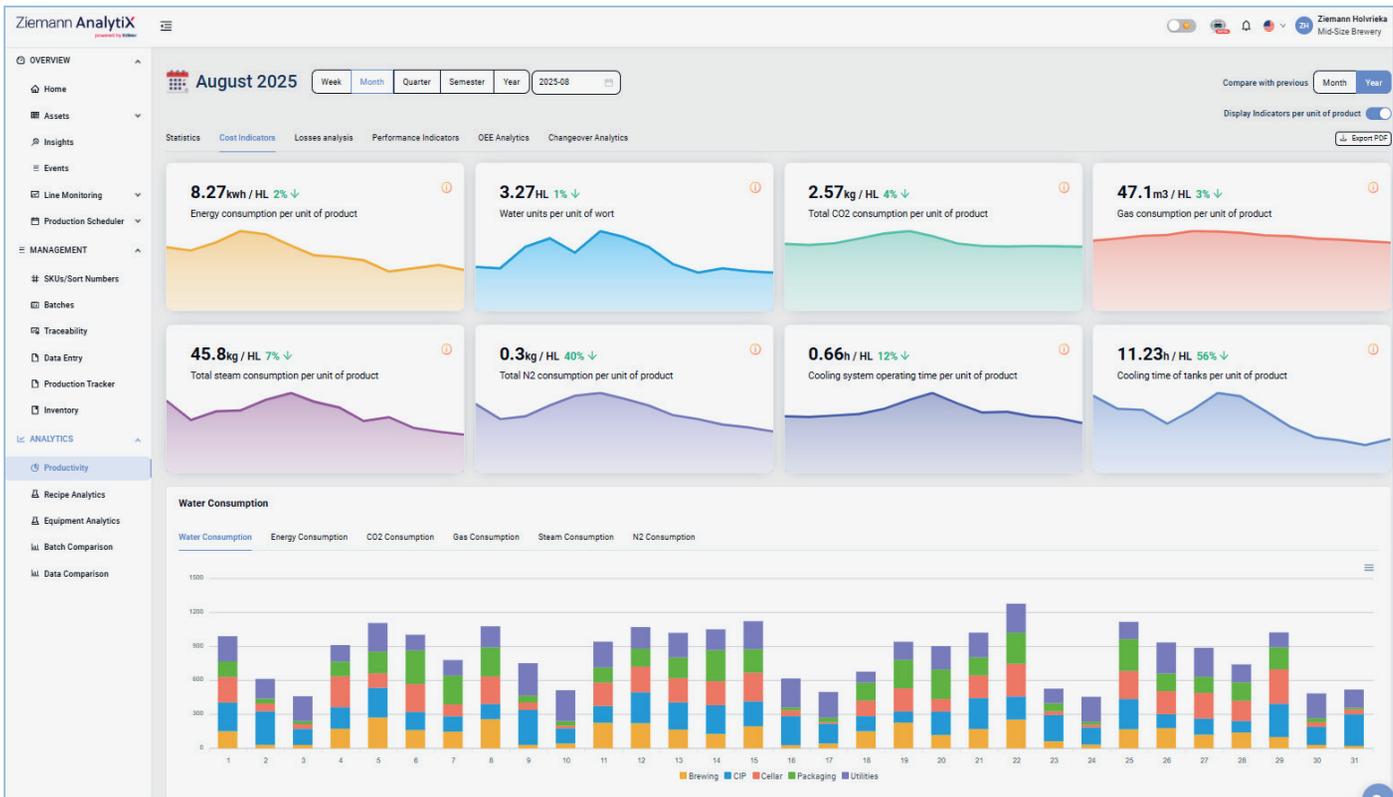
This is precisely where Ziemann AnalytiX comes into play – a solution resulting from the strategic cooperation between the brewery equipment supplier Ziemann

and the brewery equipment supplier Ziemann



The connection between the production level and corporate management creates a consistent database

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Overview of cost-related KPIs for evaluating energy, water and CO₂ consumption in the brewery. The data can be compared intuitively over time and enable a quick assessment of the performance

Holvrieka and the software company Indeex. While Indeex provides the digital infrastructure for an interactive, cloud-based data analysis platform, developed specifically for breweries, Ziemann Holvrieka contributes its decades of experience in brewing technology in the form of complementary consulting services.

Together, they have developed a product, which is tailored to the requirements of modern breweries in terms of both technology and processes [3, 4]. The data analysis platform is based on a web-based Software-as-a-Service model (SaaS) and maps the entire brewery as a digital twin – from raw material intake via fermentation and filtration up to bottling. Existing automation and IT systems are connected independently of the manufacturer via a compact plug-and-play gateway that enables secure, encrypted communication with the cloud. All operating and process data is transferred to a uniform structure, visualized in real time and made available for central analysis.

➤ **Overview of functions**

The platform has a modular structure and is available in Core and Advanced versions.

- The Core package offers functions such as
- real-time monitoring of all relevant process steps, from raw material intake to filling;
- batch management and traceability for complete documentation;
- quality control through automated recording and evaluation of laboratory and process data;
- AI-supported analysis to identify energy, water and raw material losses;
- automatic detection of deviations with immediate notification of the responsible departments.

The Advanced package expands the platform with a powerful business intelligence app that enables in-depth analysis of key production figures. With this expansion, production figures can be visualized over defined periods, cost and performance-related indicators such as water or energy consumption can be monitored, and different batches can be compared with each other.

Breweries which also focus on optimizing their bottling operations can integrate the optional Filling & Packaging package. This package provides specific analysis functions for filling and packaging processes

and enables a holistic view of the value chain.

The use of AI-based analyses enables the early identification of inefficiencies, such as peak loads or leaks in production. In addition, concrete optimisation potential for the use of water, energy and raw materials is identified. On this basis, breweries benefit from automated reporting formats, exportable ESG key figures and a valid data base – directly from the process data, without any human interaction and the associated potential for error. This can be advantageous for achieving strategic sustainability goals, ESG reporting or preparing for industry-specific audits and certifications.

➤ **Data flood becomes measurable benefit**

The mere availability of production data and key figures does not yet lead to optimizations or savings. Ziemann AnalytiX addresses this challenge by combining the technological platform with modular, practical consulting services. These can be flexibly adapted to the individual needs of the brewery and help to identify effective measures. Only through implementa-

tion can measurable added value be created.

› **Consulting as a success factor**

An interdisciplinary team of brewery experts, software developers and process engineers provides ongoing support to customers. The type and scope of consulting services are tailored to the individual needs of each brewery. The range of services extends from regular remote checks and structured workshops for problem identification, to in-depth KPI analyses, on-site audits and tailor-made recommendations for action.

In this context, both operational issues such as energy efficiency and production stability, as well as strategic topics such as investment planning or ESG reporting can be addressed.

The external perspective of the team of experts provides particular added value: while internal structures are often characterised by established routines, an outside view enables objective evaluation and critical reflection on existing processes. This allows blind spots to be identified, inefficient patterns to be uncovered and new solutions to be developed – always in line with best practices and international benchmarks, which the team brings with it from decades of international experience. Breweries not only receive well-founded recommendations for action, but also, if desired, direct support in the corresponding implementation from one single source.

At the same time, the collaboration serves to provide targeted qualification and training for employees. They learn to use the platform independently, interpret the key figures correctly and make data-based decisions. This approach leads to the development of a sustainable understanding of digital process optimisation, which goes beyond temporary improvements [5]. The continuous support provided by Ziemann Holvrieka ensures regular reflection and further development of new insights, which makes a decisive contribution to establishing a learning organisation and securing long-term competitiveness.

› **Proven components – newly combined**

There is great diversity in the world of data analysis platforms, but real added

value is rare. Ziemann AnalytiX combines a tried-and-tested analysis platform with targeted consulting, based on decades of experience in brewing technology. This combination not only enables the structured visualization of operational data, but also its immediate translation into effective optimisation measures. The data analysis thus contributes to increased efficiency and improved quality in beverage production.

Ziemann AnalytiX provides a comprehensive, manufacturer-independent solution for analysing and utilising process data across the entire brewery. The platform can be easily integrated into existing automation structures and is compatible with all common process control and monitoring systems – regardless of the hardware or control technology used. The seamless connection between the production level and corporate management creates a consistent database, which goes far beyond the analysis of individual process steps. It enables a holistic view of processes and creates the basis for well-founded decisions, targeted optimisations and sustainable efficiency improvements – from production to management.

› **Practical experience**

The Distelhäuser Brewery is a successful practical example, which has been actively involved in the implementation as a pilot plant. As in many breweries, a range of data was collected here, including production figures, laboratory analyses, business management information, etc. However, up to now, there had been no cross-system, structured evaluation of this data. Ziemann AnalytiX could be integrated at the Distelhäuser Brewery without any major modifications or system changes – even taking into account and integrating a long-established process control system in the traditional beer cellar. Shortly after commissioning, the platform delivered its first usable insights, such as consumption peaks in energy use or deviations in batch parameters.

Many users particularly praise the interactive and intuitive usability, the rapid availability of relevant KPIs and the concrete benefits provided by the accompanying consulting services. The evaluation of the data and the direction of supplementary consulting services are always tailored

to the customers and geared towards the respective operational challenges. Depending on requirements, different priorities can be set – for example, in the areas of energy consumption, process stability or plant availability. Based on the insights gained, targeted measures can be derived in the further course of the process, for example to optimize the use of energy.

› **Conclusion: Using data sensibly**

Ziemann AnalytiX powered by Indeex offers breweries a unique combination of a powerful analysis platform and practical advice. The solution is manufacturer-independent, retrofit-capable and ready for immediate use. It creates transparency across the entire production process and provides AI-supported recommendations for action, which are validated and implemented by experienced brewery technologists. At the same time, the platform is continuously being developed. Monthly updates ensure that all breweries automatically benefit from the latest functions and improvements, without any additional installation effort. Successful projects in practice, such as at the Distelhäuser Brewery, show that added value is created as soon as data is understood and translated into corresponding actions and measures. ■

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